Реализация гибридного гетерогенного (поддерживающего OSS frameworks & operating systems) облака на технологиях Microsoft

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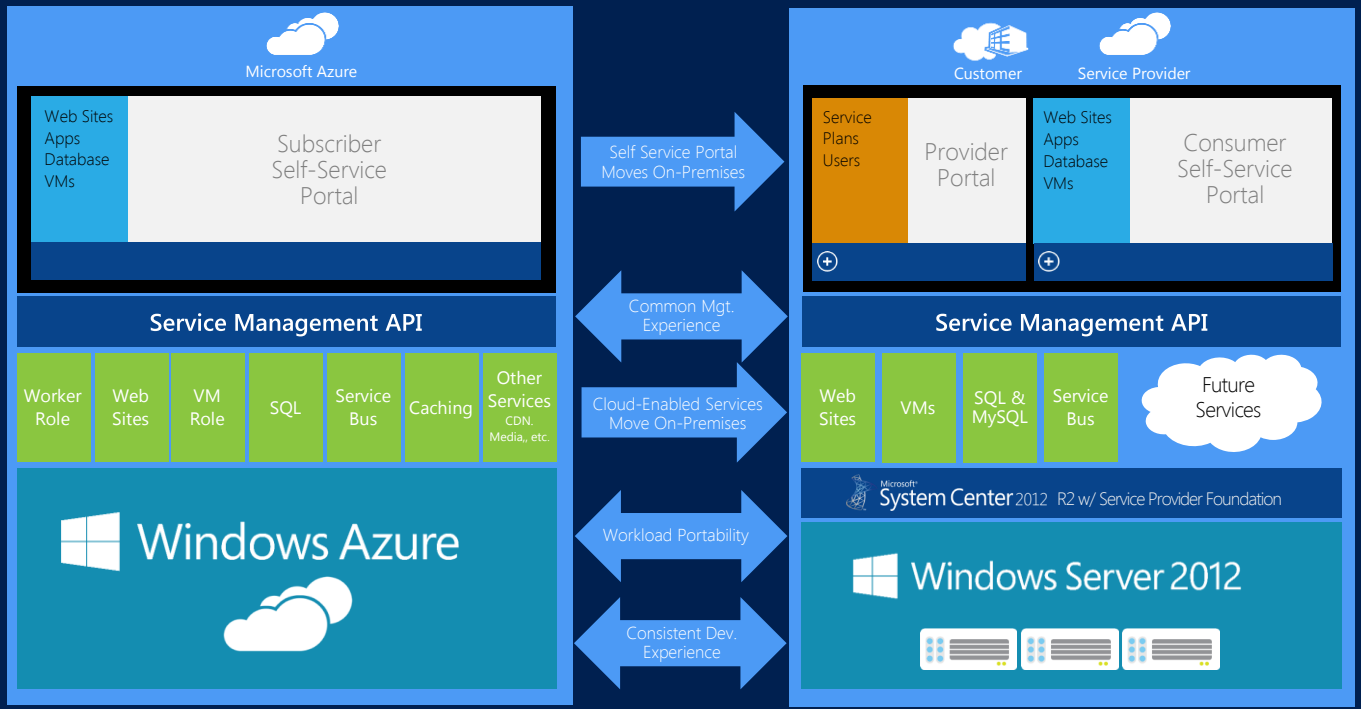
- Windows Azure Pack Architecture
- Windows Azure Pack Views
  - Provider
  - Consumer
- Hosting Scenarios
  - VM Hosting (IaaS)
  - Websites
  - Hosted Databases (SQL/MySQL)
  - Service Bus

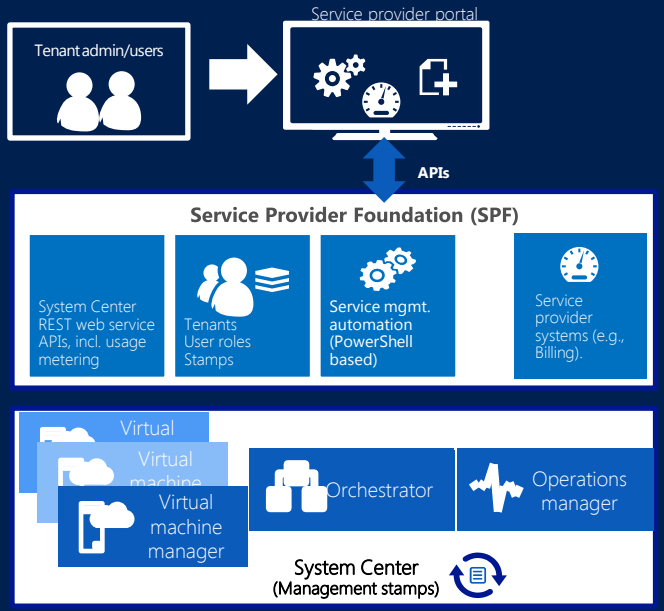
Windows Azure Pack Overview

Cloud OS Consistent Experiences



Multi-tenant cloud infrastructure

- Simplified infrastructure service delivery
- In-box service templates and runbooks for System Center components
- Integrate existing investments using web-based interfaces to System Center capabilities
- Scale management across multiple System Center instances (or "stamps")
- Extensible service management automation
- Tenant-level resource metering for capacity planning and usage analytics



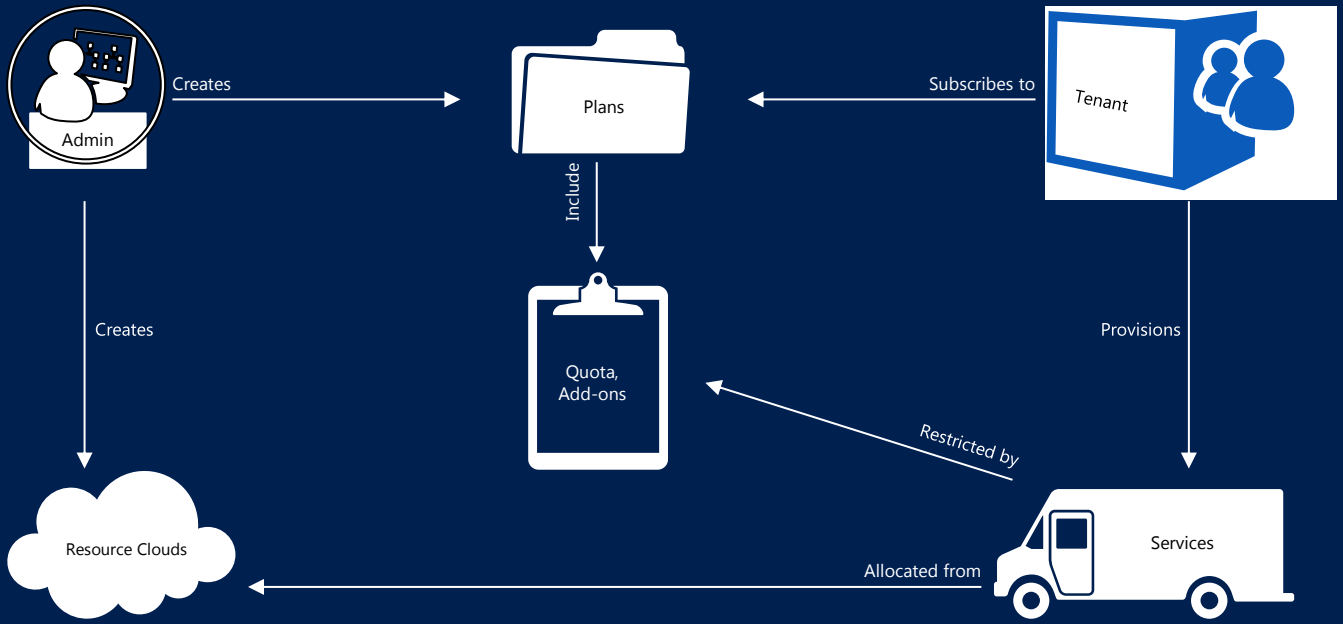
Service Provider View for Windows Azure Pack

Service Providers

Administration

- Integrate into existing systems to orchestrate & automate end to end processes
- Out of the box runbooks to automate delivery of cloud services
- Import additional integration modules and author PowerShell workflow runbooks within Service Management portal
- Operational dashboard for analysis and troubleshooting
- Authentication using Active Directory

Plans define Admin—Tenant relationship

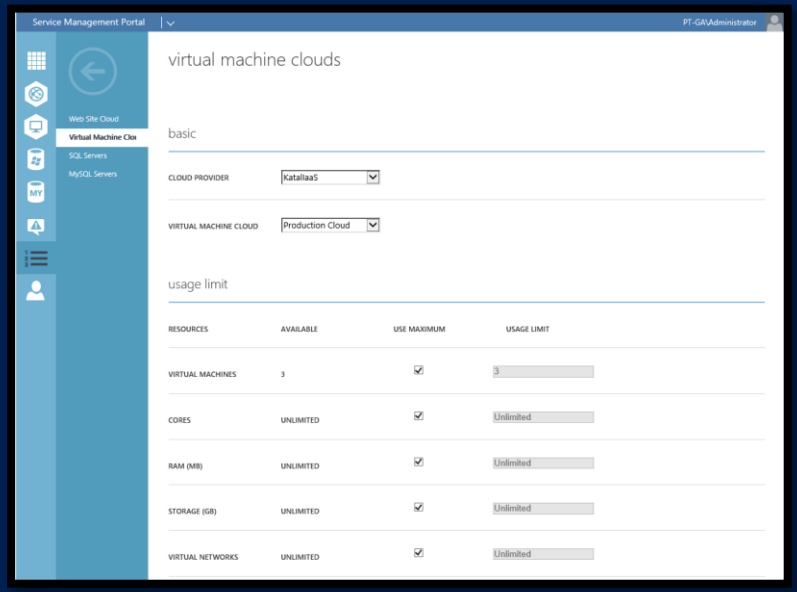


Admin: create VM cloud

Connect cloud to VMM instance

Define usage limits

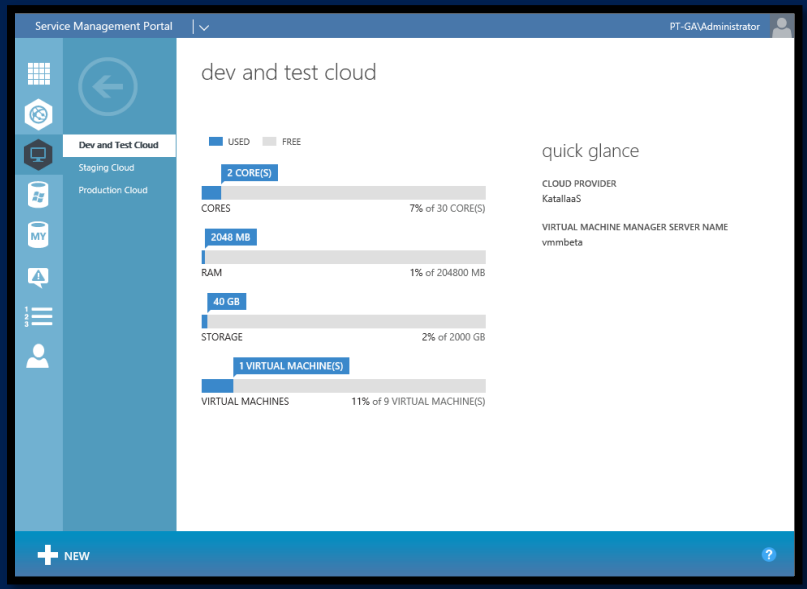
Assign VM templates & networks



Admin: monitor VM cloud

Review usage statistics

- Memory
- Storage
- Virtual CPUs
- Virtual Machines

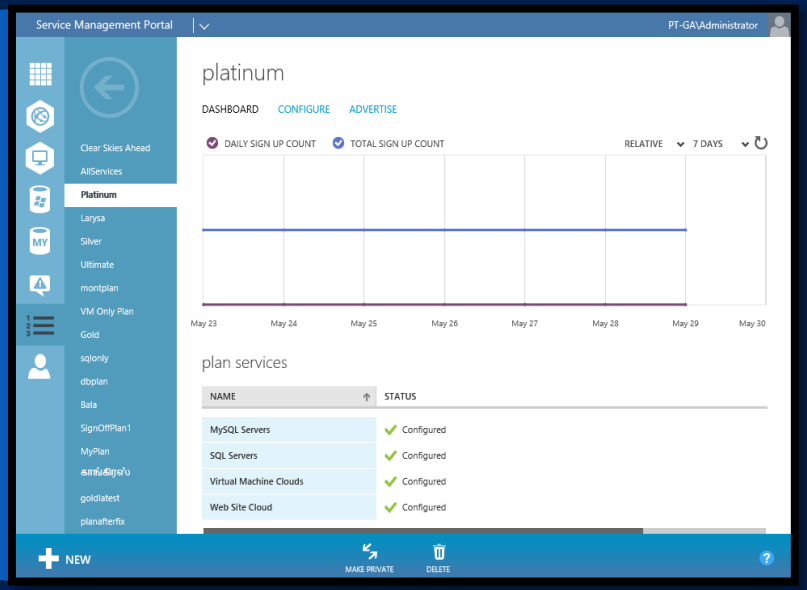


Admin: Create plan

Include one or more services

Bind services to clouds

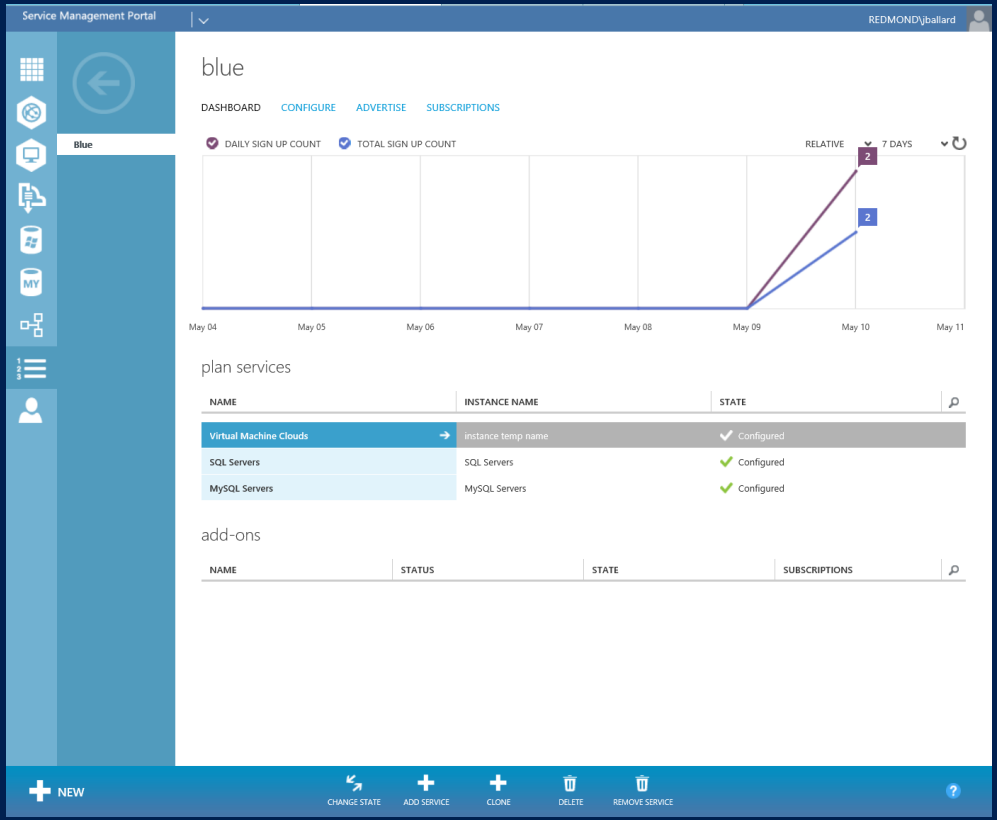
Set quotas and add-ons



Service Providers

Subscriptions

- Manage shared infra and services
  - Virtual Machine Clouds
  - Web Site Clouds
  - Service Bus Clouds
  - 3rd party shared services
- Create offers of select services
  - Define unique quotas per service
  - Define offer add-ons for upsell
  - Include curated gallery applications
  - Publish public or private offers


Service Management Portal
REDMOND\jballard
Blue
blue
DASHBOARD
CONFIGURE
ADVERTISE
SUBSCRIPTIONS
DAILY SIGN UP COUNT
TOTAL SIGN UP COUNT
RELATIVE
7 DAYS
2
2
May 04
May 05
May 06
May 07
May 08
May 09
May 10
May 11
plan services
NAME
INSTANCE NAME
STATE
Virtual Machine Clouds
instance temp name
Configured
SQL Servers
SQL Servers
Configured
MySQL Servers
MySQL Servers
Configured
add-ons
NAME
STATUS
STATE
SUBSCRIPTIONS
NEW
CHANGE STATE
ADD SERVICE
CLONE
DELETE
REMOVE SERVICE

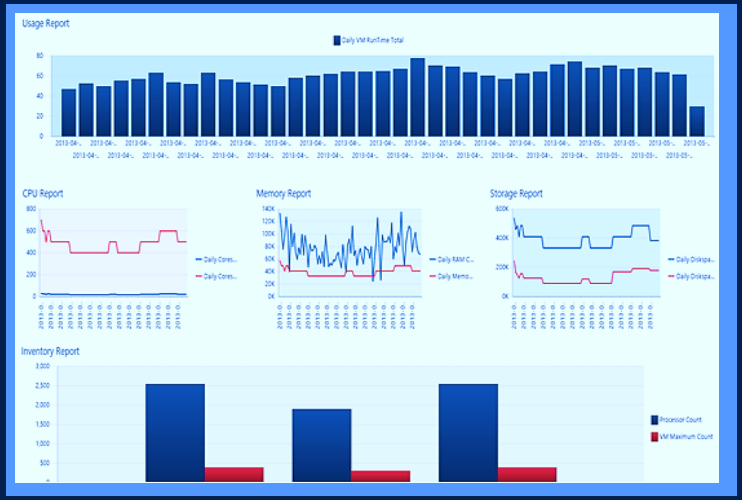
Service Providers

Usage/Billing

- Consistent interface for all Services
  - REST, OData & JSON
  - Enable 3rd party billing providers and ITFM integration
- Data Warehouse
- Analytics on Tenant Subscription usage
- Enable license compliance through inventory reports

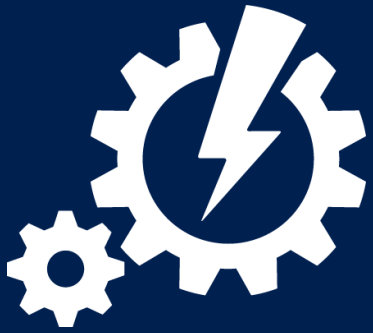
Multi-tenant cloud infrastructure: capacity planning and usage analytics

- Granular metering of resource usage by tenant, including CPU, memory & storage
- Enable business/ operational insight with tenant-level analytics
- Data warehousing & reporting, incl. allocation, utilization & license compliance views
- Integration with Cloud Cruiser cost analytics solution for billing capabilities.



Usage metering and analytics are delivered by System Center 2012 R2 through Orchestrator as SPF web-services APIs, usage data is provided by Operations Manager and VMM. Windows Azure Pack surfaces the reports.

Service Providers

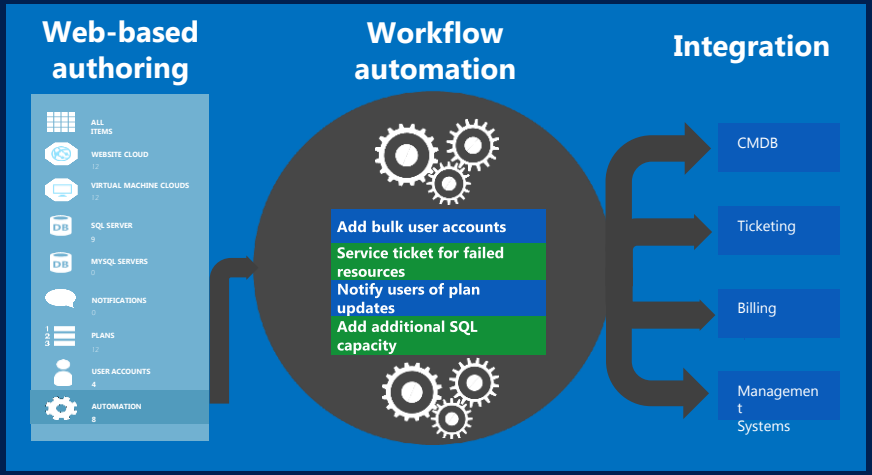


Automation

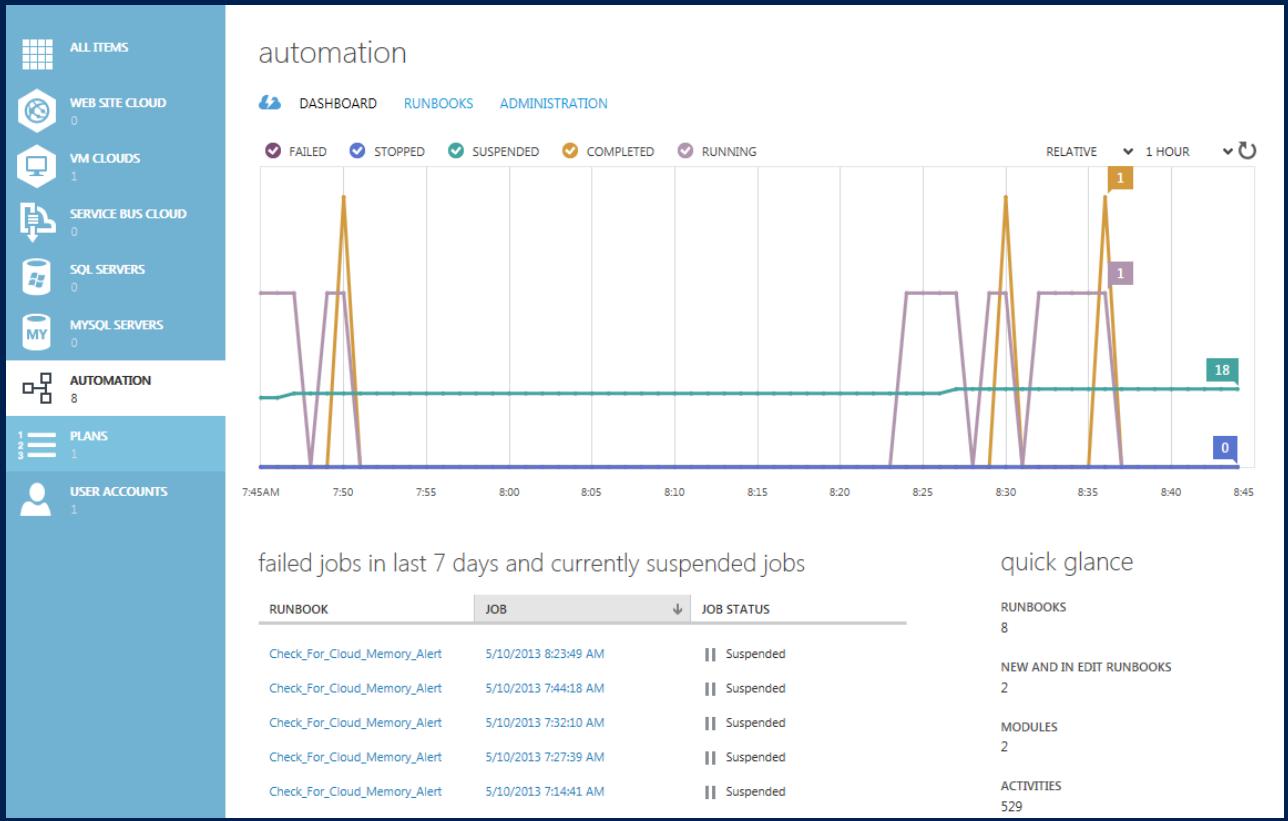
- Integrate into existing systems to orchestrate & automate end to end processes
- Out of the box runbooks to automate delivery of cloud services
- Import additional integration modules and author PowerShell workflow runbooks within Service Management portal
- Operational dashboard for analysis and troubleshooting

Service management automation

- Enable efficient infrastructure delivery and operations
- Web-based runbook authoring
- Scalable, multitenant-aware automation engine built on PowerShell
- Import existing PowerShell scripts and workflows
- Integration with existing/ third-party systems



Delivered by System Center 2012 R2 through the Orchestrator component by exposing the above features as web-service APIs along with SPF integration.


ALL ITEMS
WEB SITE CLOUD
0
VM CLOUDS
1
SERVICE BUS CLOUD
0
SQL SERVERS
0
MYSQL SERVERS
0
AUTOMATION
8
PLANS
1
USER ACCOUNTS
1
automation
DASHBOARD
RUNBOOKS
ADMINISTRATION
FAILED
STOPPED
SUSPENDED
COMPLETED
RUNNING
RELATIVE
1 HOUR
1
1
18
0
7:45AM
7:50
7:55
8:00
8:05
8:10
8:15
8:20
8:25
8:30
8:35
8:40
8:45
failed jobs in last 7 days and currently suspended jobs
RUNBOOK
JOB
JOB STATUS
Check_For_Cloud_Memory_Alert
5/10/2013 8:23:49 AM
Suspended
Check_For_Cloud_Memory_Alert
5/10/2013 7:44:18 AM
Suspended
Check_For_Cloud_Memory_Alert
5/10/2013 7:32:10 AM
Suspended
Check_For_Cloud_Memory_Alert
5/10/2013 7:27:39 AM
Suspended
Check_For_Cloud_Memory_Alert
5/10/2013 7:14:41 AM
Suspended
quick glance
RUNBOOKS
8
NEW AND IN EDIT RUNBOOKS
2
MODULES
2
ACTIVITIES
529

Windows Azure Pack Portal Customization

White Label

- Easily skin portal with your theme and brand
- Custom login, logos, banner, colors, extensions, etc…
- Safe Java allows some additional stable customization

Add-On Services

- REST API
- Onramp for more Azure Services moving to Windows Server
- Any number of services can be surfaced in the portal

Differentiated

- Portal source code provided
- Replace the portal with your own by providing support for the API

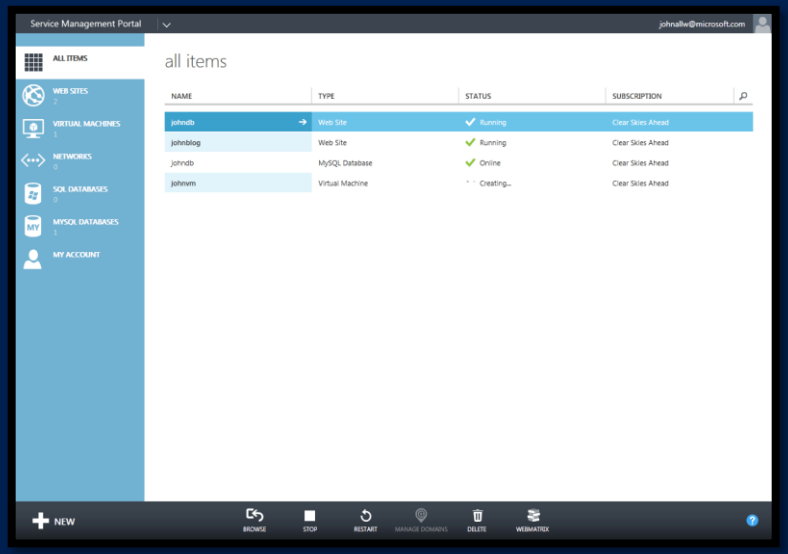
Service Consumers View for Windows Azure Pack

Tenant experience Homepage

Rich self-service experience

Windows Azure consistency

Monitor and provision services

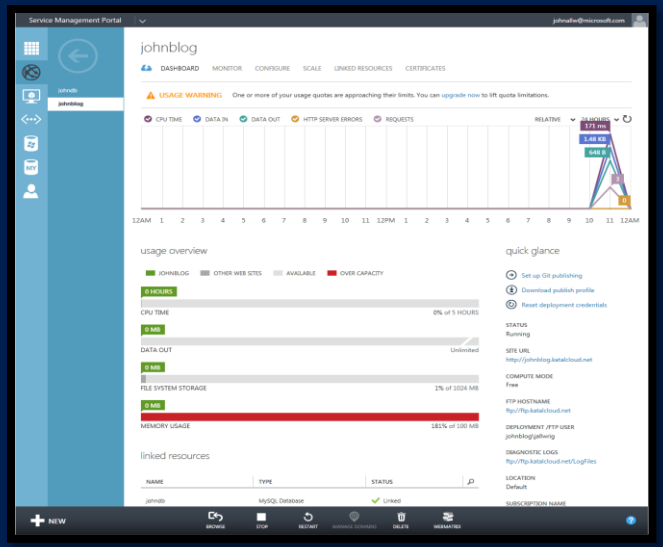


Tenant experience Dashboard

Core service dashboard

Configuration and control

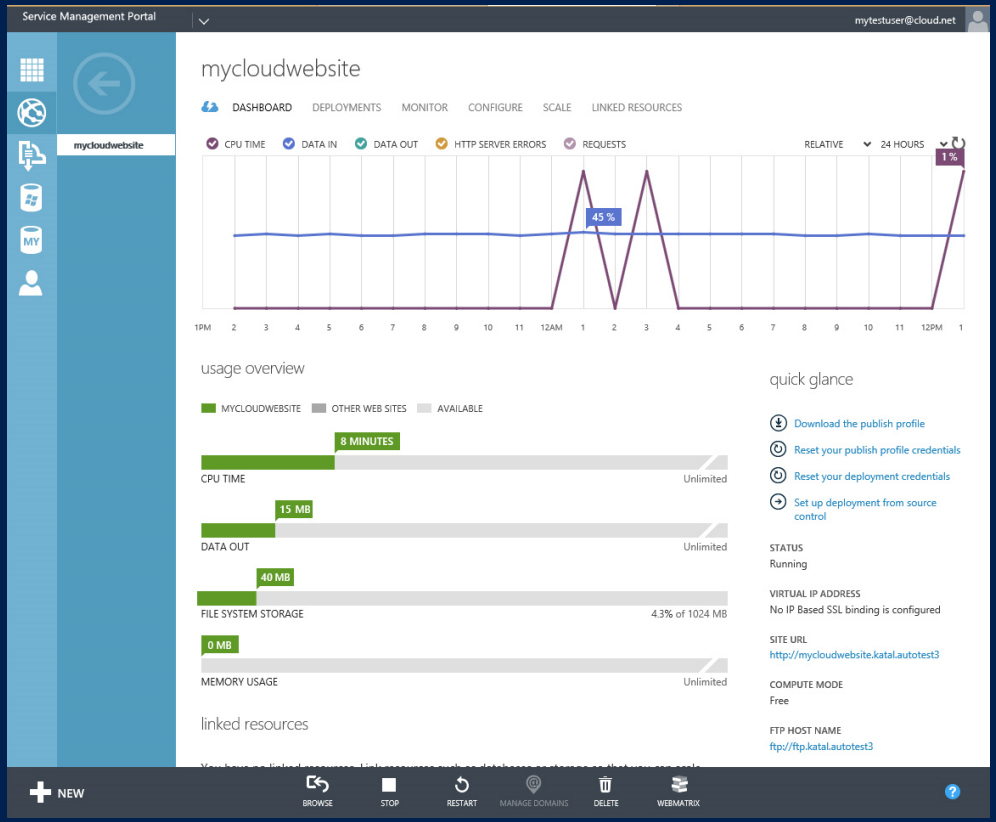
Utilization reporting



Service Consumers

Web sites

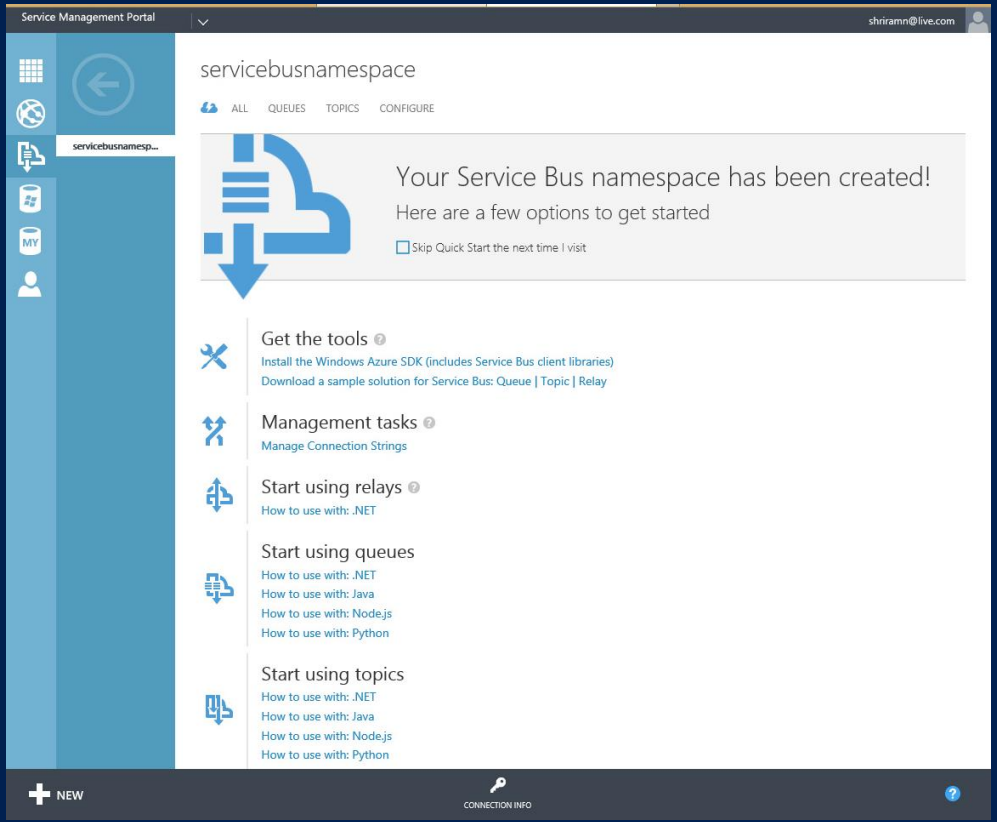
- Build highly scalable web applications
- Iterate with integrated source control
- Manage their apps with real-time telemetry
- Use the languages and open source apps of their choice


Service Management Portal
mytestuser@cloud.net
mycloudwebsite
DASHBOARD
DEPLOYMENTS
MONITOR
CONFIGURE
SCALE
LINKED RESOURCES
CPU TIME
DATA IN
DATA OUT
HTTP SERVER ERRORS
REQUESTS
RELATIVE
24 HOURS
1 %
45 %
1PM 2 3 4 5 6 7 8 9 10 11 12AM 1 2 3 4 5 6 7 8 9 10 11 12PM 1
usage overview
MYCLOUDWEBSITE
OTHER WEB SITES
AVAILABLE
8 MINUTES
CPU TIME
Unlimited
15 MB
DATA OUT
Unlimited
40 MB
FILE SYSTEM STORAGE
4.3% of 1024 MB
0 MB
MEMORY USAGE
Unlimited
linked resources
quick glance
Download the publish profile
Reset your publish profile credentials
Reset your deployment credentials
Set up deployment from source control
STATUS
Running
VIRTUAL IP ADDRESS
No IP Based SSL binding is configured
SITE URL
http://mycloudwebsite.katal.autotest3
COMPUTE MODE
Free
FTP HOST NAME
ftp://ftp.katal.autotest3
NEW
BROWSE
STOP
RESTART
MANAGE DOMAINS
DELETE
WEBMATRIX

Service Consumers

Service Bus

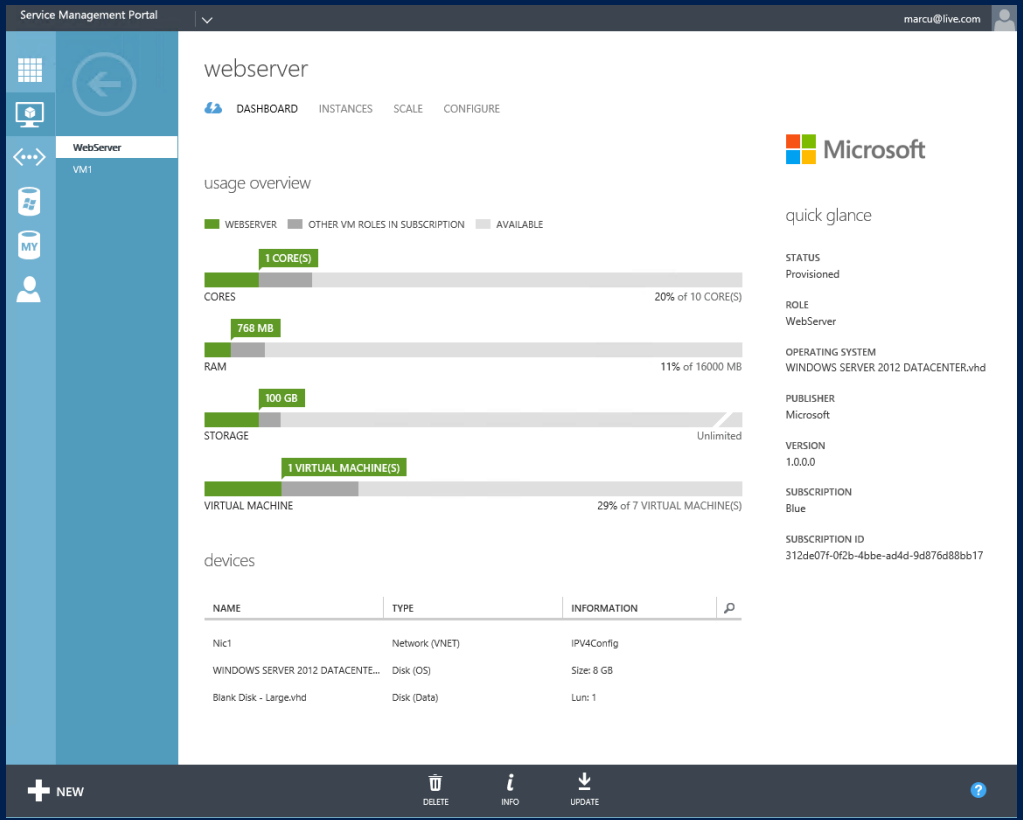
- Messaging service for cloud apps
- Guaranteed message delivery
- Publish-subscribe messaging patterns
- Standard protocols (REST, AMQP, WS*)
- Interoperability (.NET, Java/JMS, C/C++)
- Integrated with management portal


Service Management Portal
shriramn@live.com
servicebusnamespace
ALL
QUEUES
TOPICS
CONFIGURE
servicebusnamesp...
Your Service Bus namespace has been created!
Here are a few options to get started
Skip Quick Start the next time I visit
Get the tools
Install the Windows Azure SDK (includes Service Bus client libraries)
Download a sample solution for Service Bus: Queue | Topic | Relay
Management tasks
Manage Connection Strings
Start using relays
How to use with: .NET
Start using queues
How to use with: .NET
How to use with: Java
How to use with: Node.js
How to use with: Python
Start using topics
How to use with: .NET
How to use with: Java
How to use with: Node.js
How to use with: Python
NEW
CONNECTION INFO

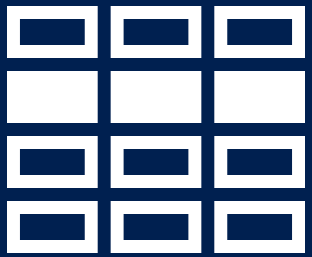
Service Consumers

Virtual Machine

- Virtual Machine Roles
  - Portable
  - Elastic
  - Gallery
  - Windows and Linux Support
- Virtual Networks
  - Site to Site connectivity
  - Tenant supplied IP addresses


Service Management Portal
marcu@live.com
WebServer
VM1
webserver
DASHBOARD
INSTANCES
SCALE
CONFIGURE
usage overview
WEBSERVER
OTHER VM ROLES IN SUBSCRIPTION
AVAILABLE
1 CORE(S)
CORES
20% of 10 CORE(S)
768 MB
RAM
11% of 16000 MB
100 GB
STORAGE
Unlimited
1 VIRTUAL MACHINE(S)
VIRTUAL MACHINE
29% of 7 VIRTUAL MACHINE(S)
devices
NAME
TYPE
INFORMATION
Nic1
Network (VNET)
IPV4Config
WINDOWS SERVER 2012 DATACENTE...
Disk (OS)
Size: 8 GB
Blank Disk - Large.vhd
Disk (Data)
Lun: 1
Microsoft
quick glance
STATUS
Provisioned
ROLE
WebServer
OPERATING SYSTEM
WINDOWS SERVER 2012 DATACENTER.vhd
PUBLISHER
Microsoft
VERSION
1.0.0.0
SUBSCRIPTION
Blue
SUBSCRIPTION ID
312de07f-0f2b-4bbe-ad4d-9d876d88bb17
NEW
DELETE
INFO
UPDATE

Service Consumers



Additional Services

Identity
- ADFS Federation integrates with Consumers own Active Directory
- Co-administrators

Database Services
- SQL Server
- MySQL

Value add services from gallery

Other shared services from provider

Programmatic access to cloud services
- REST APIs

VM Hosting (IaaS)

Definitions

Virtual Machine Role Gallery

- Catalog of Virtual Machine Role templates for tenants. Tenants view a curated and role-scoped list of Virtual

Virtual Machine Role Gallery Item

- A single Virtual Machine Role template

Virtual Machine Role

- Homogenous scalable tier of Virtual Machines.

Virtual Machine Role View Definition (VIEWDEF)

- UI artifact for a gallery item. The VIEWDEF includes constructs to build the ui wizard in order for the tenant to enter values for deployment.

Virtual Machine Role Resource Definition (RESDEF)

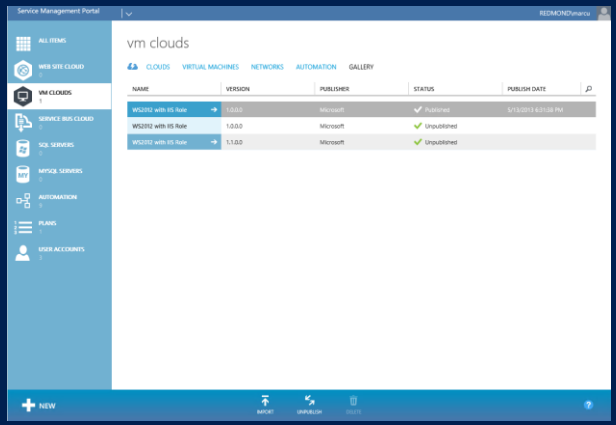
- Template artifact for a Virtual Machine Role. The RESDEF includes hardware, network, OS, and Application configuration.

Virtual Machine Role Resource Extension (RESEXT)

- Application template and installation payload (MSI, scripts, SQL DAC, etc) used to deploy an application into a Virtual Machine Role.

Service Admin Gallery

- Import and Manage Gallery Items
- Resource Definition Package
- Publish / Unpublish Gallery Items to Tenants
- Immediate impact when unpublishing
- Add Gallery Items to Plans
- Scopes access based on plan and subscription
- Gallery Item authorization from SPF
- Resource extension from VMM



Tenant Virtual Machine Features

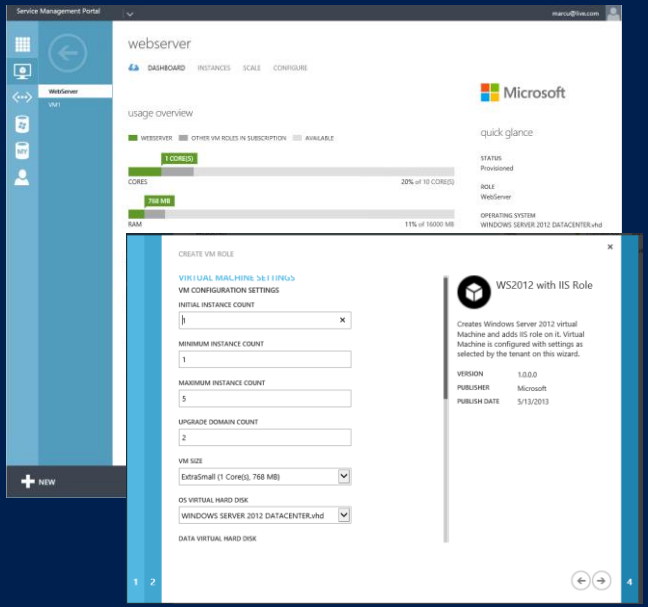
Cloud OS Virtual Machine Role

- Scale-out and Scale-In of a Virtual Machine Role
- Update settings
- Upgrade to new version
- Change networks
- Start/Stop/Shutdown VMs
- Add/Remove Devices

Support for VM Templates

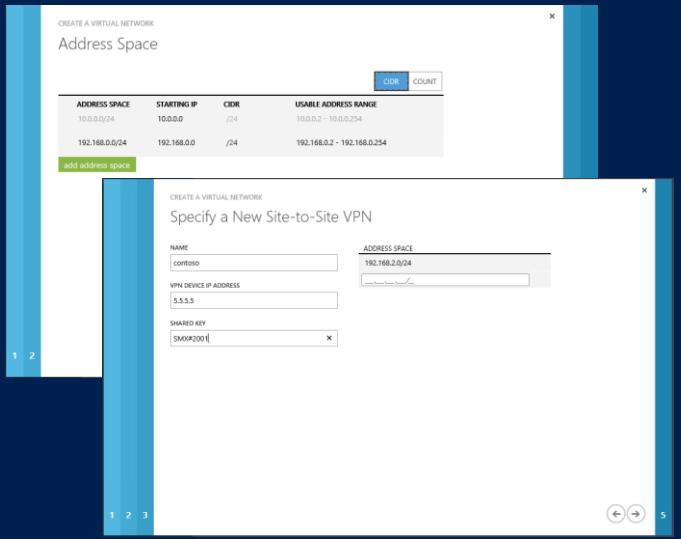
Active Directory Authentication

Co-admins can share subscription



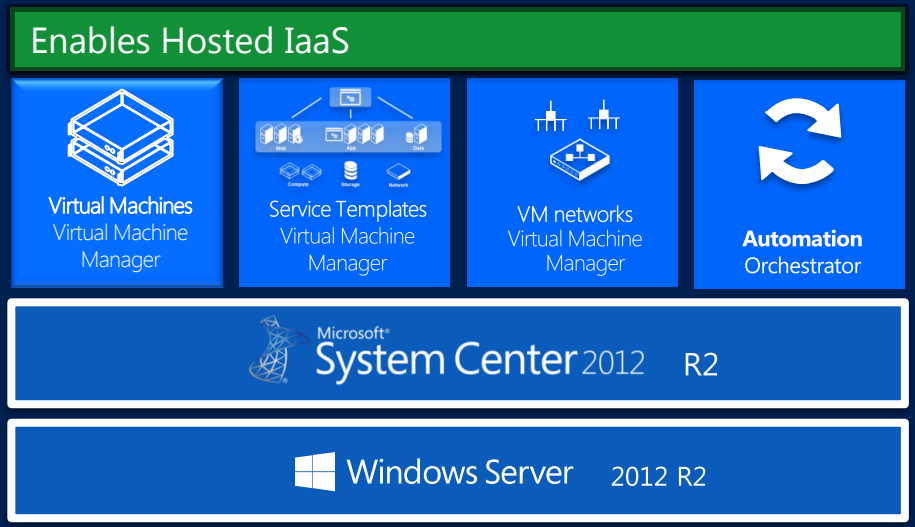
Tenant Networks

- Tenants create their own networks
- Site to Site VPN
- Network Address Translation (NAT)
- Configuration of topology and border gateway protocol (BGP)
- Tenant IP addresses with network virtualization
- Consistent user experience with Azure



Service Provider Foundation (SPF)

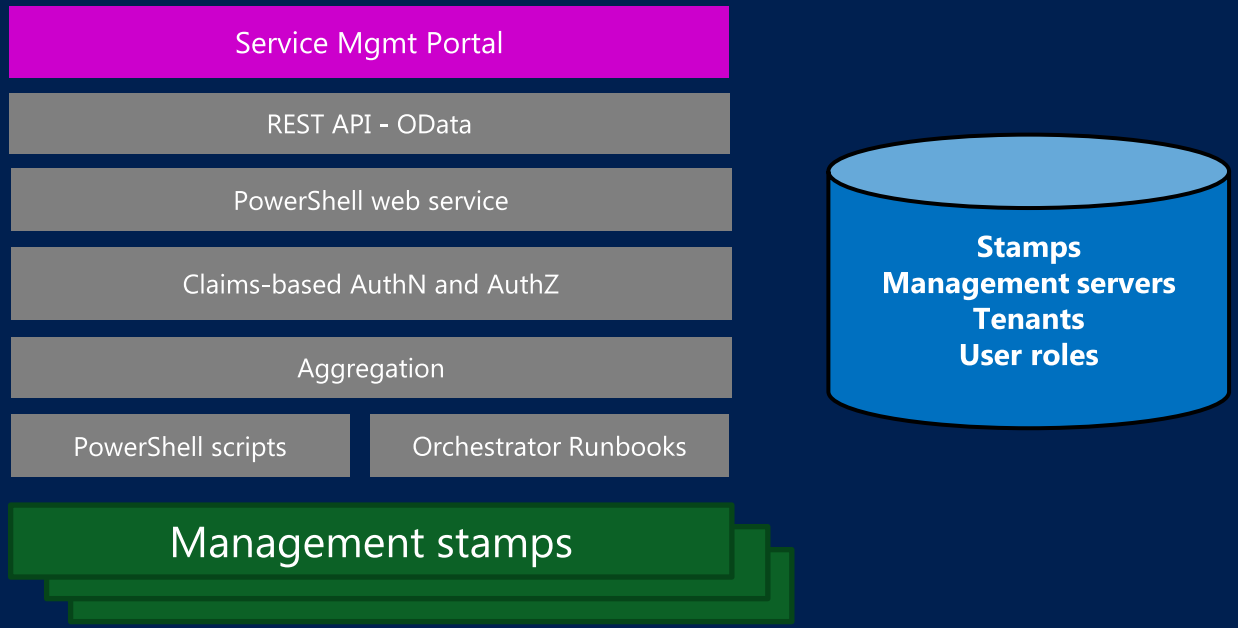
REST-based Odata API



Features

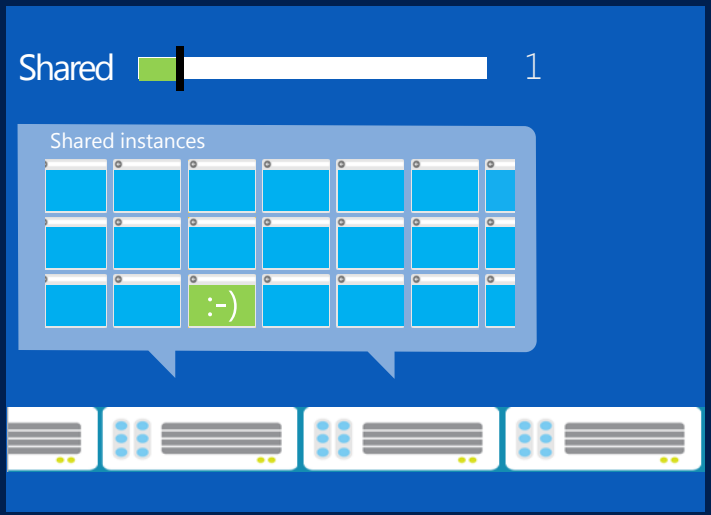
- VM management
- Service management
- Self-service VM networks
- Multi-tenancy / Multi-stamp
- Self-service tenant administration
- Enterprise identity for SPF
- Extensibility for hosted cloud API
- Usage Metering via SCOM

SPF architecture



Website Hosting

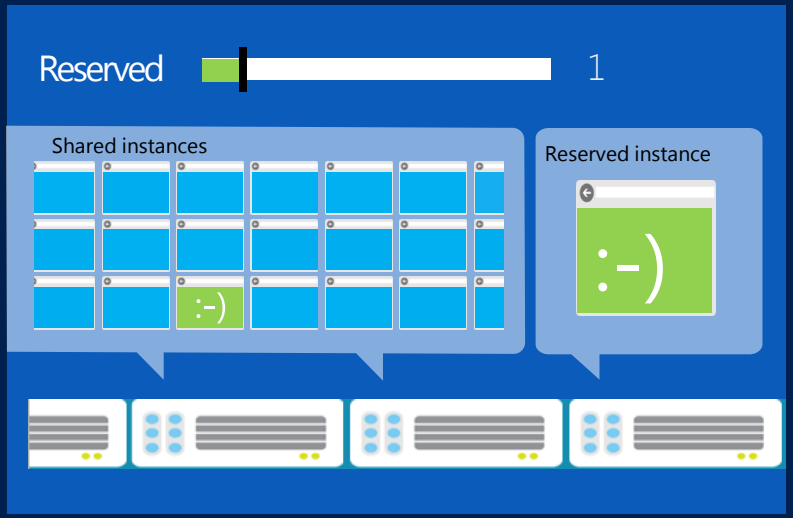
Shared & reserved instances



Deploy web sites into a shared/multi-tenant hosting environment running on a shared set of server resources.

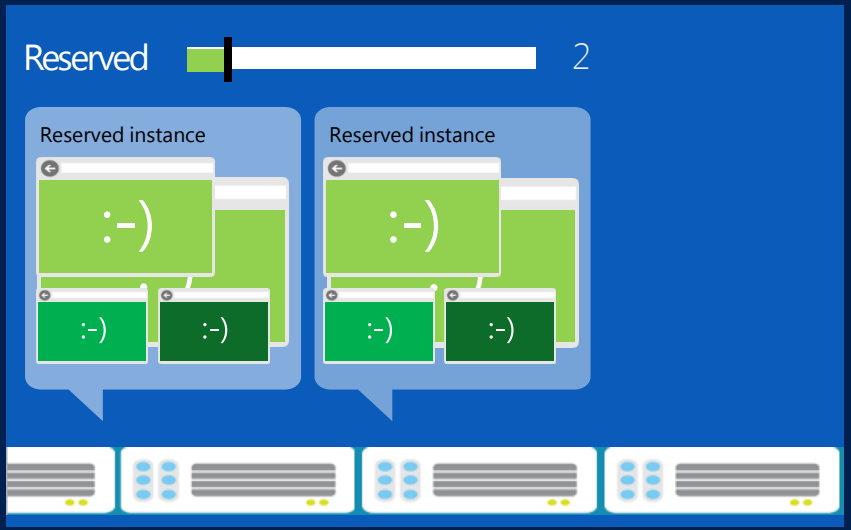
- When a website is first created it runs in shared mode.
- It shares available compute resources with other subscribers that are also running websites in shared mode.

Shared and reserved instances



- Websites can be upgraded optionally to run in reserved mode. This isolates them to run within a dedicated virtual machine.
- When you change the mode from shared to reserved, the website is scaled up.

Shared and reserved instances



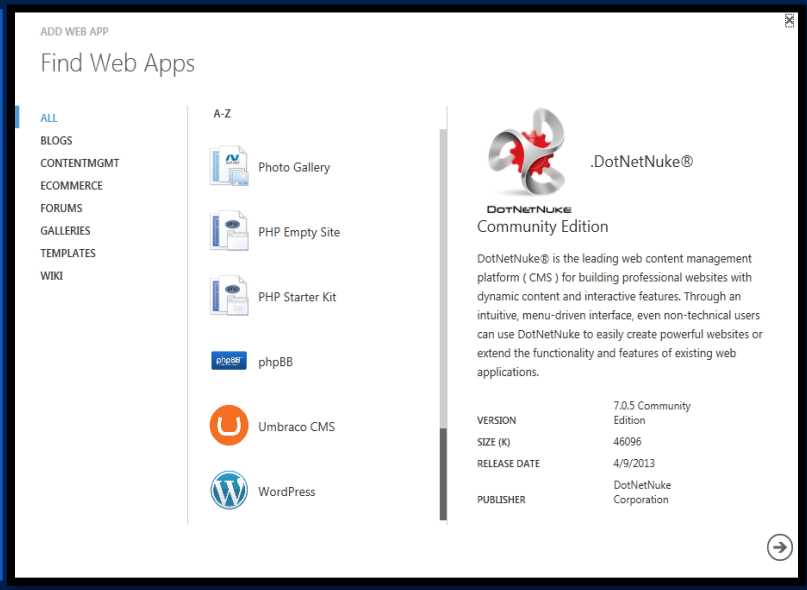
- Elastically scale the resources sites use to increase reserved instance capacity as traffic increases.
- Increasing the value for **Reserved Instance Count** will provide fault tolerance and improved performance through scale out.
- A website in **Reserved** mode will provide more consistent performance than a website in **Shared** mode because it is not sharing resources with other tenants.
- If Reserved Instance size is changed from **Small** to **Medium** or **Large**, the website will run in a compute instance of corresponding size with access to associated resources for each size.

Web app gallery

Customizable self-service gallery

Popular web apps

Database integration



Source code and developer tools

Microsoft® WebMatrix

Visual Studio

Visual Studio Team Foundation Server

CodePlex

GitHub

Atlassian Bitbucket

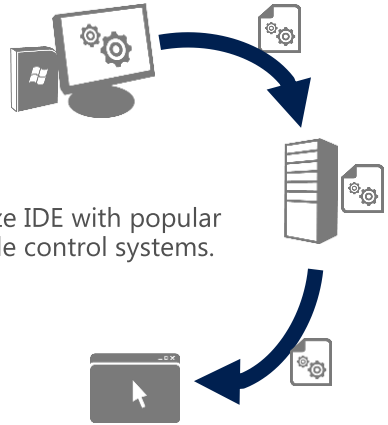
Dropbox

Node.js, PHP, ASP.NET,

WebDeploy

FTP/HTTP

Use familiar developer tools.



Synchronize IDE with popular source code control systems.

Upload to production folders.

SQL Database Hosting (DBaaS)

SQL Server/MySQL

SQL Server Hosting (SQL/MySQL) Features

- SQL Databases per subscription
- SQL Groups
- SQL Add-Ons
- Manage Database: View Info, Change Password, Resize and Delete
- SQL AlwaysOn Support
- Create Website with SQL Database
- Management Tasks: APIs and PowerShell Support
- SQL Usage reporting

Administrative Features

Server View

- Add and maintain SQL Hosting Servers & AlwaysOn Availability Group Listeners(AGL)
- Dashboard: View Total Space Utilization per Hosting Server
- List of all databases in a Server

SQL Group View

- Add and maintain Logical Groups for better maintainability
- Move Servers or AGLs between SQL Groups
- Type: Standalone Vs AlwaysOn enabled

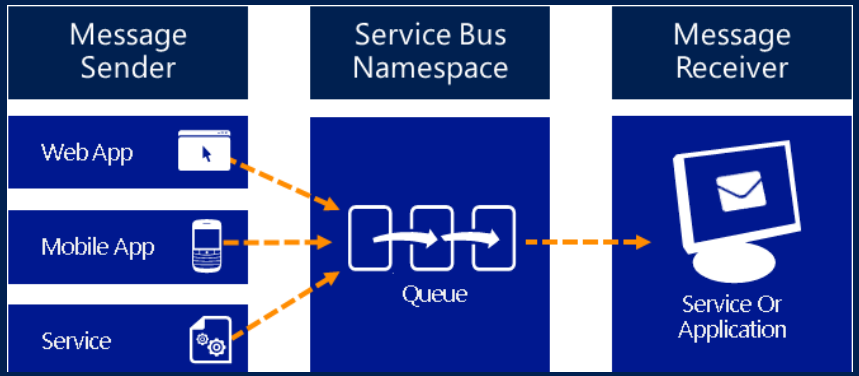
Tenant Features

Database View

- Create and maintain databases as part of the subscription
  - Create database against a SQL Database Edition available to subscription
- Manage Database: View Info, Change Password, Resize and Delete
- Subscribe to AddOns: Increase Database count and Size
- Usage summary per subscription : no. of databases and additional storage

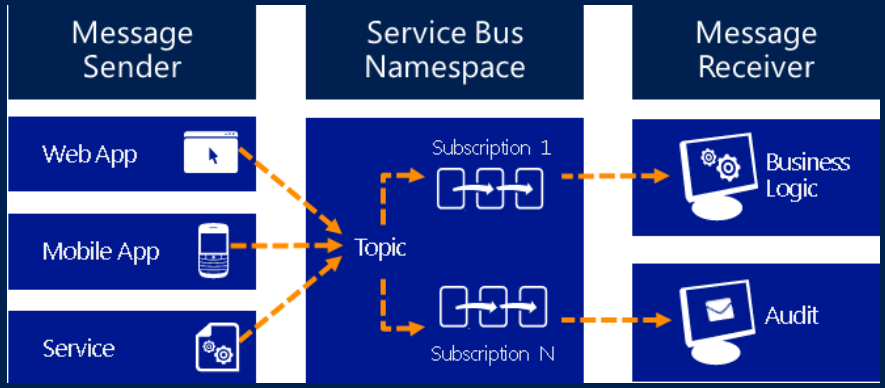
Service Bus Hosting

Service Bus Queues
One way asynchronous messaging.

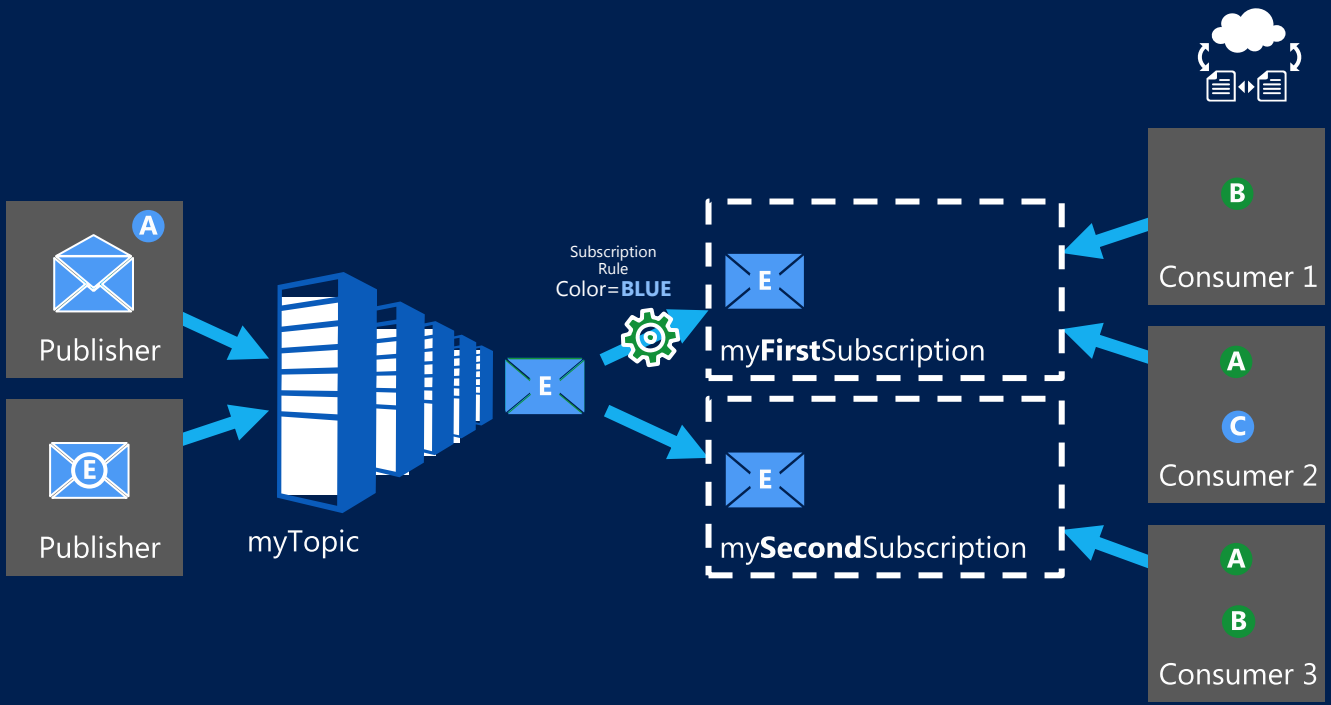


Example: ServiceBus Queues

Service Bus topics and subscriptions
Publish-subscribe one-to-many messaging



Example : Service Bus Topics



Cloud OS Consistent Experiences